

What is Claimed Is:

1. A communications system comprising:
- stratospheric platform having a payload controller and a phased array antenna having a plurality of elements for generating a first beam and a second beam;
- a gateway station in communication with said stratospheric platform, said gateway station receiving a first signal having a first beam having interference from the second beam therein and receiving a second signal having said second beam having interference from the first beam therein,
- said gateway station comprising a first subtracting block for subtracting said second signal from said first signal to obtain the first beam;
- said gateway station comprising a second subtracting block for subtracting said first signal from said second signal to obtain a second beam.
2. A communication system as recited in claim 1 wherein said gateway station weights said second signal with a first weight prior to subtracting said second signal from said first signal.
3. A communication system as recited in claim 1 wherein said gateway station weights said first signal prior with a second weight to subtracting said second signal from said first signal.
4. A communication system as recited in claim 1 wherein said first weight and said second weight are a function of said user position files.
5. A communications system as recited in claim 1, wherein the payload controller comprises a demultiplexer for receiving control signals.

1 6. A communications system as recited in claim 2, wherein
2 the demultiplexer generates a plurality of element control signals.

1 7. A system as recited in claim 3, wherein the element
2 control signals are coupled to an RF feed, the RF feed is coupled to elements of
3 said phased array antenna.

1 8. A system as recited in claim 1, wherein the gateway
2 station comprises a beam generator for generating beam signals.

1 9. A system as recited in claim 1, wherein said gateway
2 station further comprises a multiplexer/demultiplexer.

1 10. A system as recited in claim 7, wherein said
2 multiplexer/demultiplexer comprises a code division multiplexer/demultiplexer.

1 11. A system as recited in claim 1, wherein said ground
2 station is coupled to a terrestrial network.

1 12. A system as recited in claim 9, wherein said terrestrial
2 network comprises the Internet.

1 13. A system as recited in claim 9, wherein the terrestrial
2 network comprises the public service telephone network.

1 14. A method of controlling a communications system
2 having a stratospheric platform, said method comprising the steps of:
3 receiving a first signal having a first beam having interference
4 from the second beam therein at a gateway station;
5 receiving a second signal having a second beam having
6 interference from the first beam therein at the gateway station,

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7 subtracting said second signal from said first signal to obtain a
 8 the first beam; and
 9 subtracting said first signal from said second signal to obtain a
 10 second beam.

1 15. A method as recited in claim 14 wherein prior to the step
 2 of subtracting said second signal from the first signal having a payload
 3 controller and a phased array antenna having a plurality of elements for
 4 generating a first beam and a second beam; weighting the second signal with a
 5 first weight.

1 16. A method as recited in claim 15 wherein prior to the step
 2 of subtracting said first signal from the second signal a gateway station in
 3 communication with said stratospheric platform, said gateway station receiving
 4 a first signal having a first beam having interference from the second beam
 5 therein and receiving a second signal having said second beam having
 6 interference from the first beam therein,
 7 said gateway station comprising a first subtracting block for
 8 subtracting said second signal from said first signal to obtain a the first beam;
 9 said gateway station comprising a second subtracting block for
 10 subtracting said first signal from said second signal to obtain a second beam
 11 weighting the first signal with a second weight.

1 17. A method as recited in claim 16 wherein said first weight
 2 and said second weight are a function of said user position files.

1 18. A method of controlling a communications system
 2 having a stratospheric platform, said method comprising the steps of:
 3 receiving a first signal having a first beam having interference
 4 from the second beam therein at a gateway station;

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